FIG. 1

NULL HYPOTHESIS H	POSSIBILITY OF TRUTH OF NULL HYPOTHESIS H	SIMILARITY OR ABANDONING CRITICAL PROBABILITY p (x, y)	WEIGHT w (p (x, y))
PIXEL VALUES v (x) = v (y) EXCEPT NOISES OF BOTH PIXELS	LARGE	HIGH	LARGE
	SMALL	LOW	SMALL

FIG. 2

RADIOGRAPHIC MEANS		SUBJECT FOR AND PURPOSE OF RADIOGRAPHING	PURPOSE OF COHERENT FILTER	METHOD OF CONSTRUCTING v (x)
EQUIPMENT	RADIOGRAPHIC METHOD			
X-RAY CT	DYNAMIC CT	TO OBSERVE DYNAMIC CHANGE	TO REDUCE NOISES WITHOUT SPOILING SPATIAL AND TEMPORAL RESOLUTIONS	PIXEL VALUES vk (x) ARE CALCULATED FROM PLURALITY OF (k) IMAGES OF IDENTICAL PART
MRI	DYNAMIC MRI	DITTO		
SPECT	DYNAMIC SPECT	DITTO		
PET	DYNAMIC PET	DITTO		
RADIOGRAPHY	FLUOROSCOPY	DITTO		
X-RAY CT	PLURALITY OF TIMES OF RADIOGRAPHING	TO OBTAIN IMAGE OF HIGH S/N RATIO	DITTO	DITTO
MRI	DITTO	DITTO		
SPECT	DITTO	DITTO		
PET	DITTO	DITTO		
GAMMA CAMERA RADIOGRAPHY	DITTO	DITTO		
X-RAY CT	MULTICHANNEL RADIOGRAPHING	TO OBTAIN MANY SORTS OF IMAGES OF HIGH S/N RATIO	DITTO	PIXEL VALUES ARE CALCULATED FROM PLURALITY OF SORTS OF IMAGES. AS TO SORTS k (k = 1, ... K), v (x) = (v1 (x), v2 (x), ... vk (x)) IS CALCULATED FROM SCALAR VALUES V k (x) AT SAME PARTS OF IMAGES k.
MRI	RADIOGRAPHING BASED ON MANY SORTS OF PULSE SEQUENCES	DITTO		
SPECT	MULTIWINDOW RADIOGRAPHING	DITTO		
PET	DITTO	DITTO		
COLOR CAMERA	COLOR RADIOGRAPHING	TO OBTAIN COLOR IMAGE OF HIGH S/N RATIO		

(CONT.)

(FIG. 2 CONTINUED)

ALL RADIO-GRAPHING EQUIPMENT	ALL RADIOGRAPHING METHODS	TO OBTAIN IMAGE OF HIGH S/N RATIO	DITTO	VECTOR VALUES v (x) OF PIXEL x IS CALCULATED AS v (x) = (v (y1), v (y2), ···, v (yk) · v (x)) BY USING SCALAR VALUES OF PIXEL Z (x) = {y1, y2, ···, yk · x} CONTAINED IN VICINITY Z (x) OF x
SPECT, PET, X-RAY CT, MRI	3D VOLUME RADIOGRAPHING	TO OBTAIN IMAGE OF HIGH S/N RATIO	DITTO	VECTOR VALUES v (x) OF PIXEL x IS CALCULATED AS v (x) = (v (y1), v (y2) ···, v (yk) · v (x)) BY USING SCALAR VALUES OF PIXEL Z (x) = {y1, y2, ···, yk · x} CONTAINED IN VICINITY Z (x) OF x. IN CASE OF 3D RADIOGRAPHING, z IS IN THREE-DIMENSIONAL VICINITY

FIG. 3

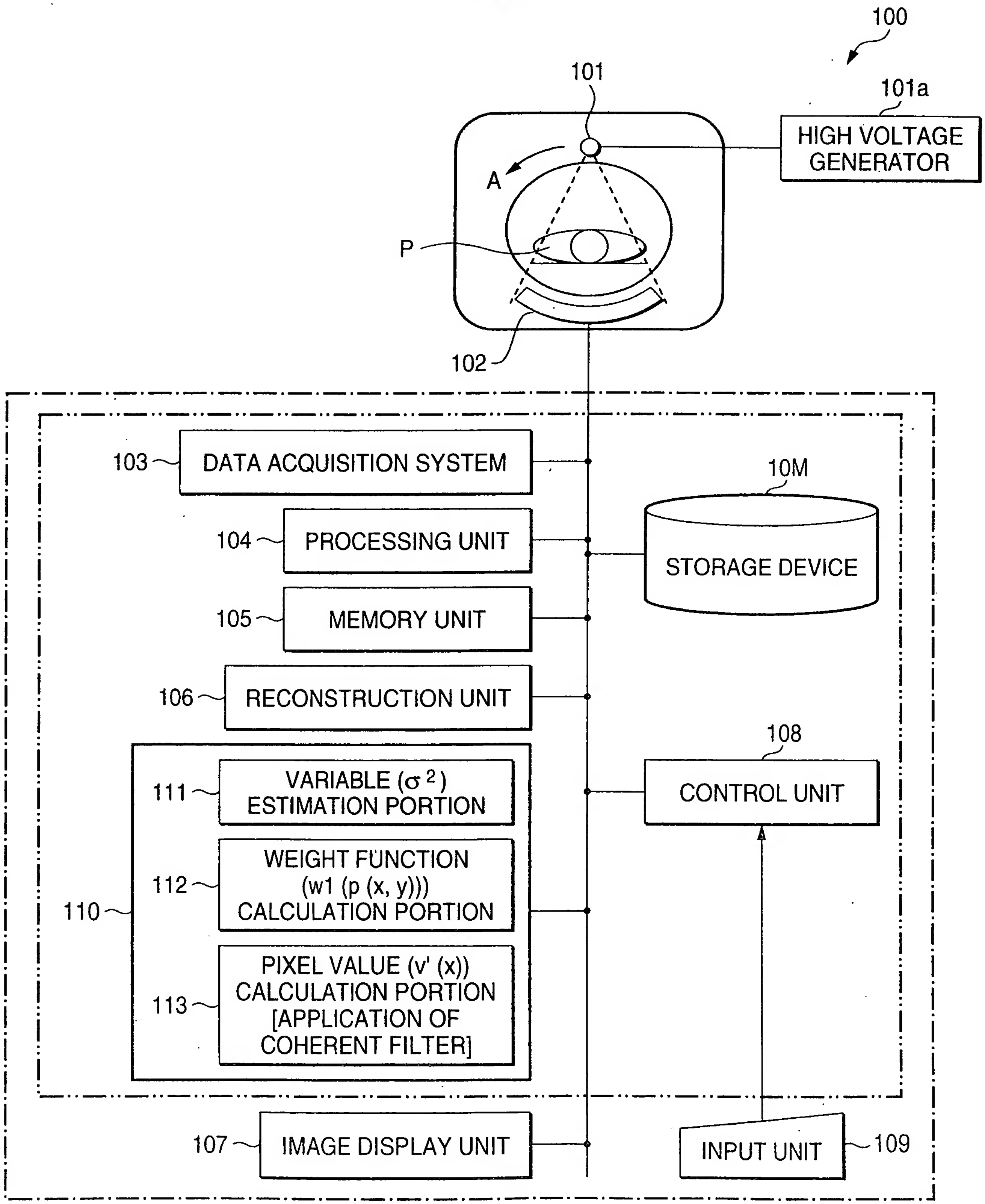

100
101
101a
HIGH VOLTAGE GENERATOR
A
P
102
103
DATA ACQUISITION SYSTEM
10M
104
PROCESSING UNIT
STORAGE DEVICE
105
MEMORY UNIT
106
RECONSTRUCTION UNIT
108
111
VARIABLE (σ 2) ESTIMATION PORTION
CONTROL UNIT
112
WEIGHT FUNCTION (w1 (p (x, y))) CALCULATION PORTION
110
113
PIXEL VALUE (v' (x)) CALCULATION PORTION [APPLICATION OF COHERENT FILTER]
107
IMAGE DISPLAY UNIT
INPUT UNIT
109

FIG. 4 (a)

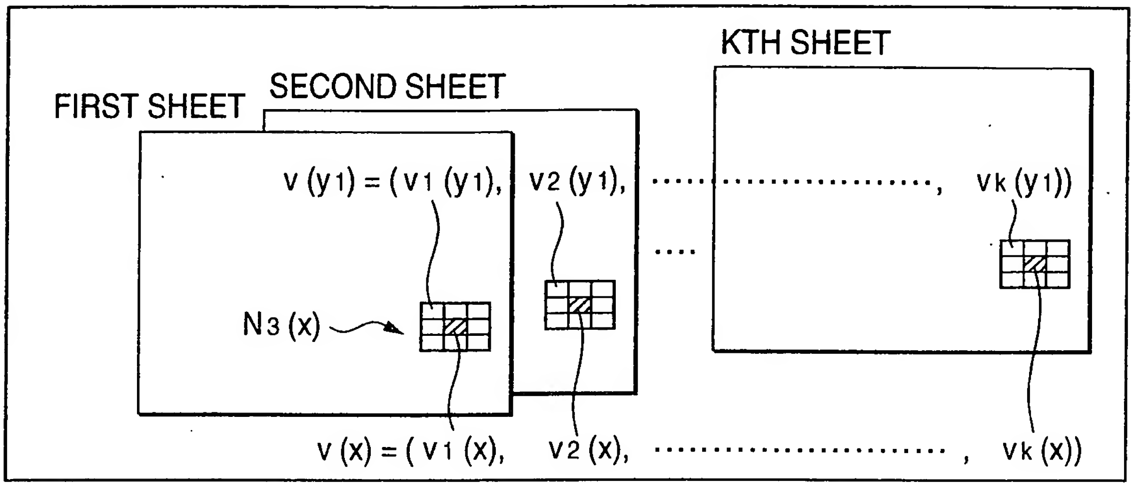


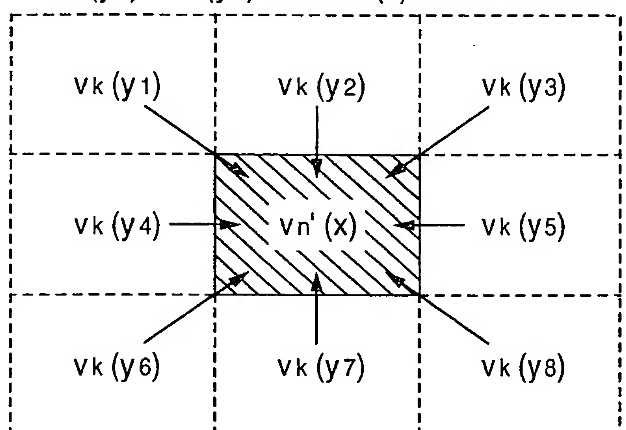
FIG. 4 (b)

WEIGHTS CONCERNING PIXELS y_1-y_8 AND x AS CALCULATED FOR SET $N^{3x3}(x)$

$w1(p(x, y_1))$	$w1(p(x, y_2))$	$w1(p(x, y_3))$
$w1(p(x, y_4))$	$w1(p(x, y))$	$w1(p(x, y_5))$
$w1(p(x, y_6))$	$w1(p(x, y_7))$	$w1(p(x, y_8))$

FIG. 4 (c)

$v'_k(x)$ CALCULATED FROM $v_k(y_1)$ - $v_k(y_8)$ AND $v_k(x)$ IN kTH IMAGE



FOR K STATIC IMAGES IN FIGURE

$$w1(p(x, y)) = \exp\left[- \left\{ \frac{\sqrt{\sum_{k=1}^{k} \frac{\{v_k(x) - v_k(y)\}^2}{K}}}{2\sigma} \right\}^C \right]$$

$$v'_k(x) = \frac{\sum_{y \in (y_1, \cdots, y_8, x)} v_k(y) \cdot w1(p(x, y))}{\sum_{y \in (y_1, \cdots, y_8, x)} w1(p(x, y))}$$

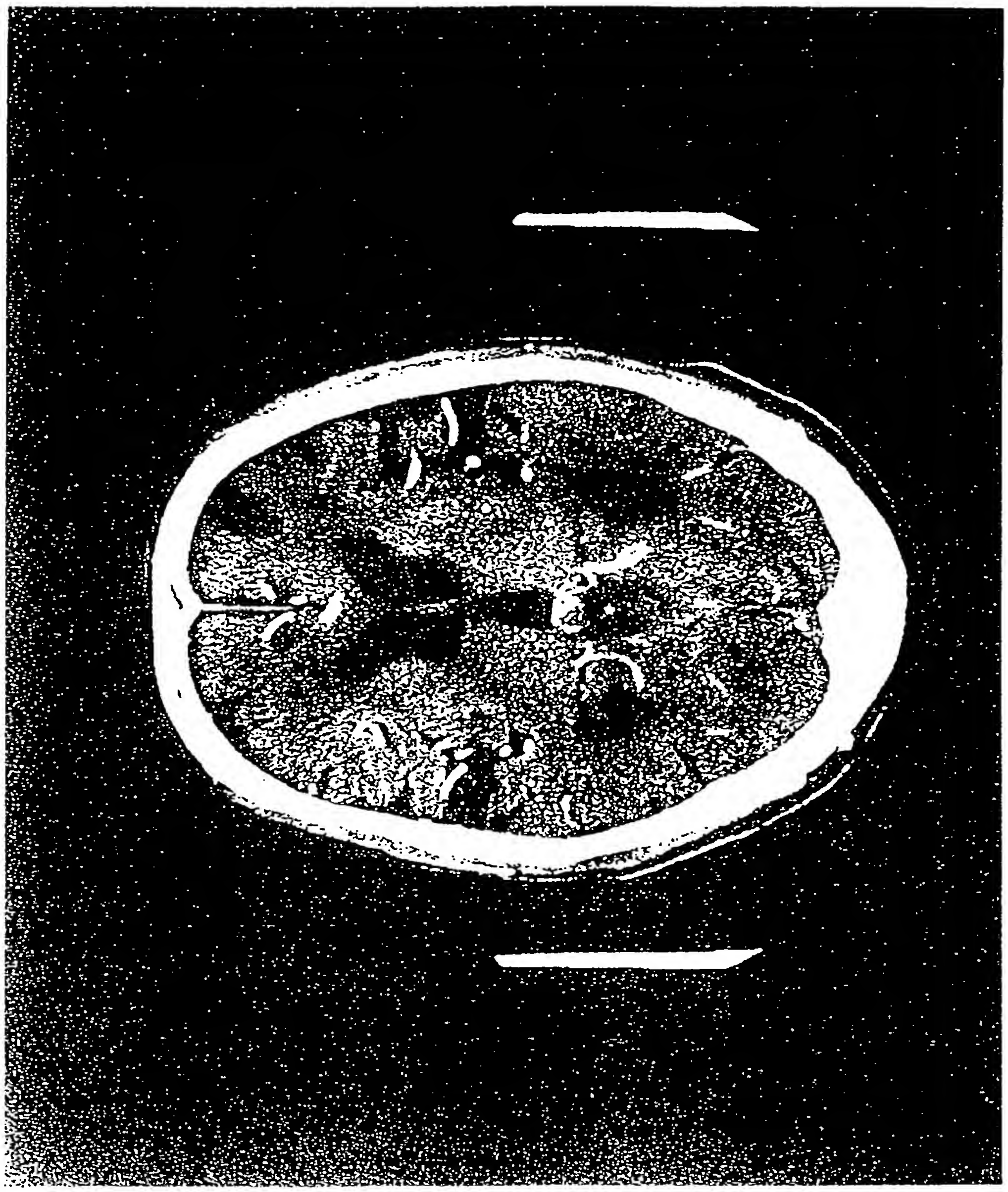


FIG. 5 (a)

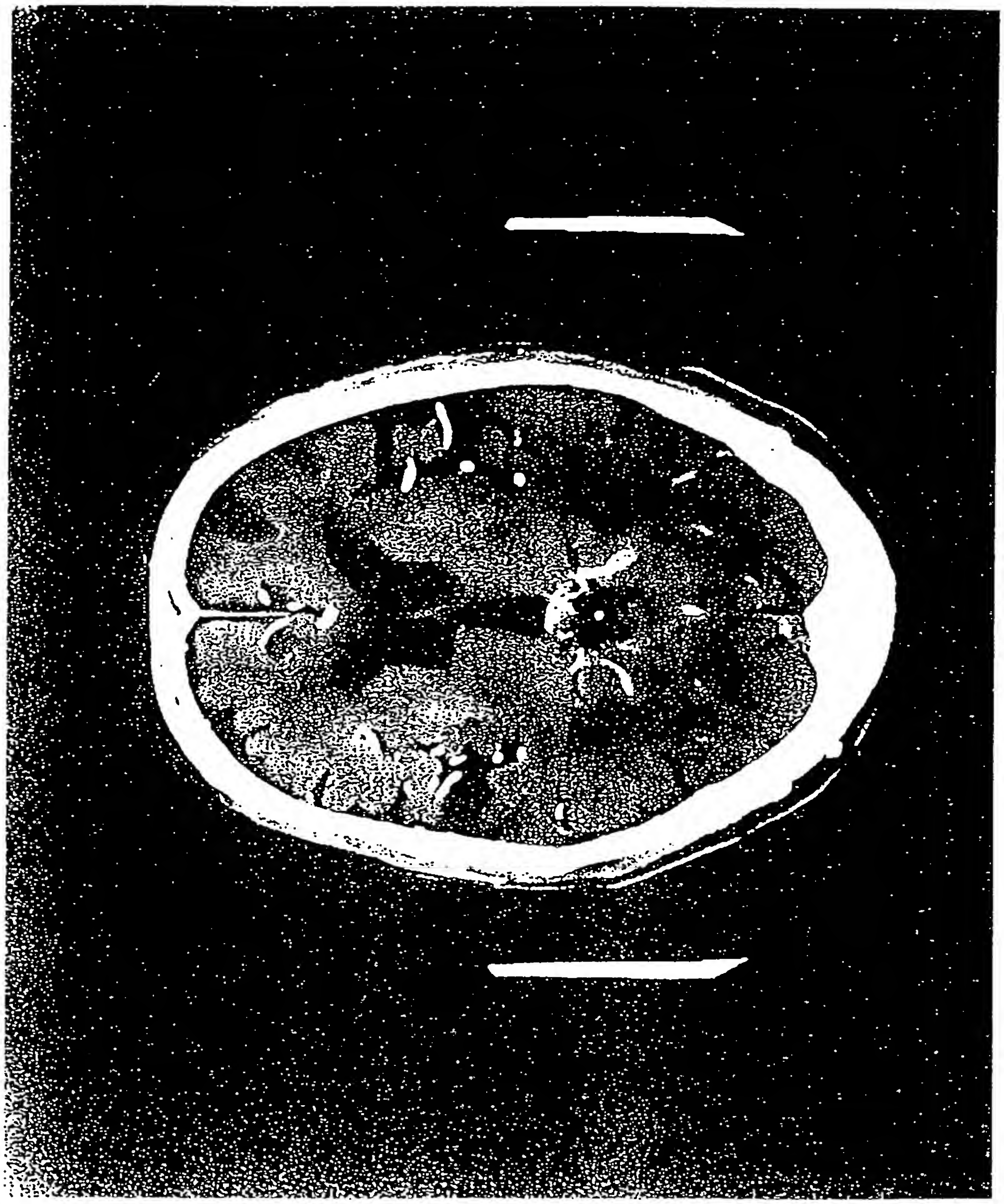


FIG. 5 (b)

FIG. 5 (c)

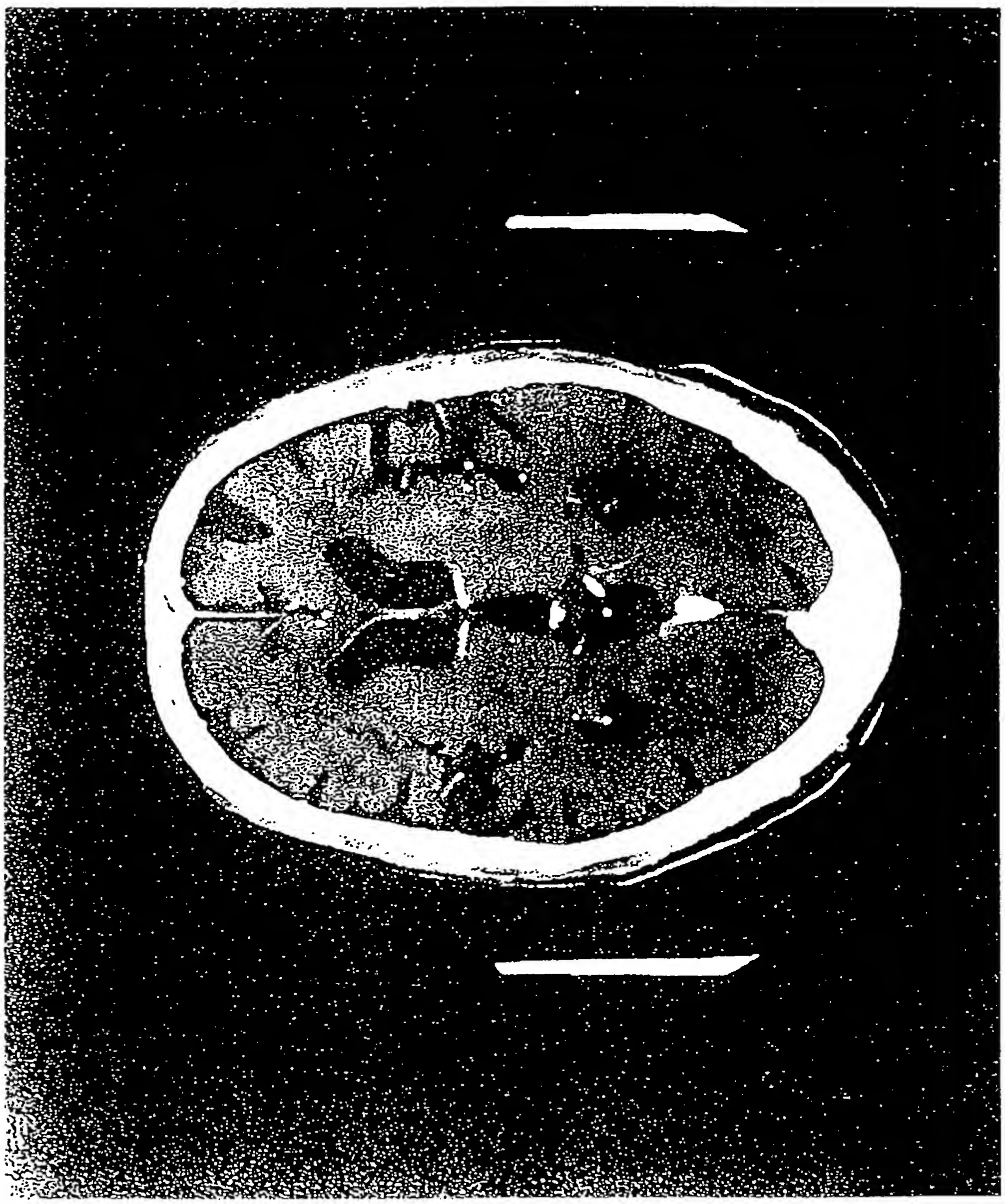


FIG. 6 (a)

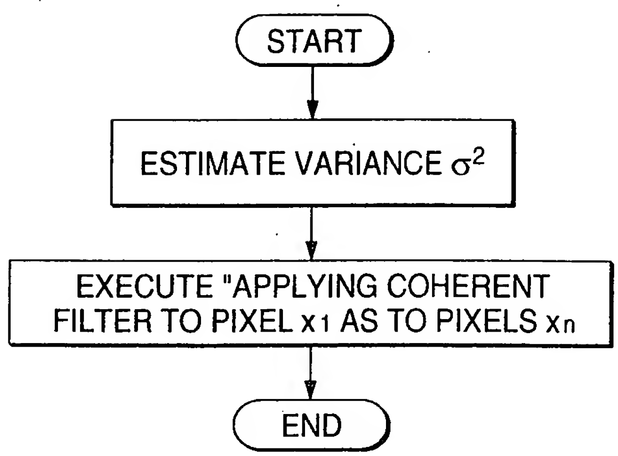
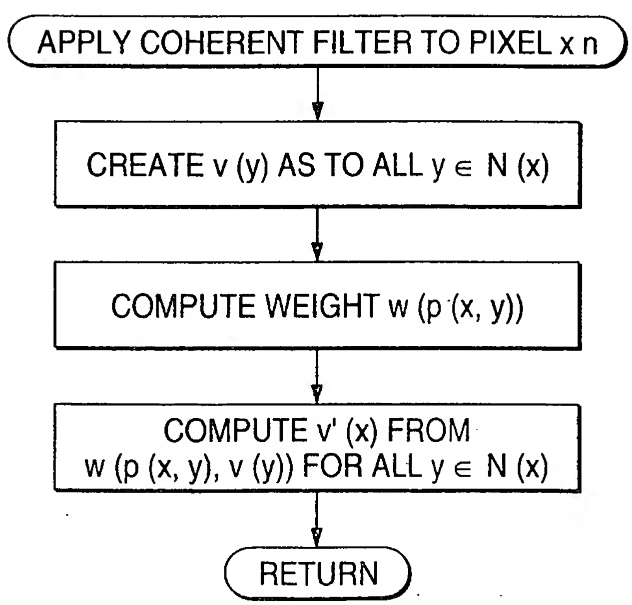

START
ESTIMATE VARIANCE σ²
EXECUTE "APPLYING COHERENT FILTER TO PIXEL x1 AS TO PIXELS xn
END

FIG. 6 (b)


APPLY COHERENT FILTER TO PIXEL x n
CREATE v (y) AS TO ALL y ∈ N (x)
COMPUTE WEIGHT w (p (x, y))
COMPUTE v' (x) FROM w (p (x, y), v (y)) FOR ALL y ∈ N (x)
RETURN

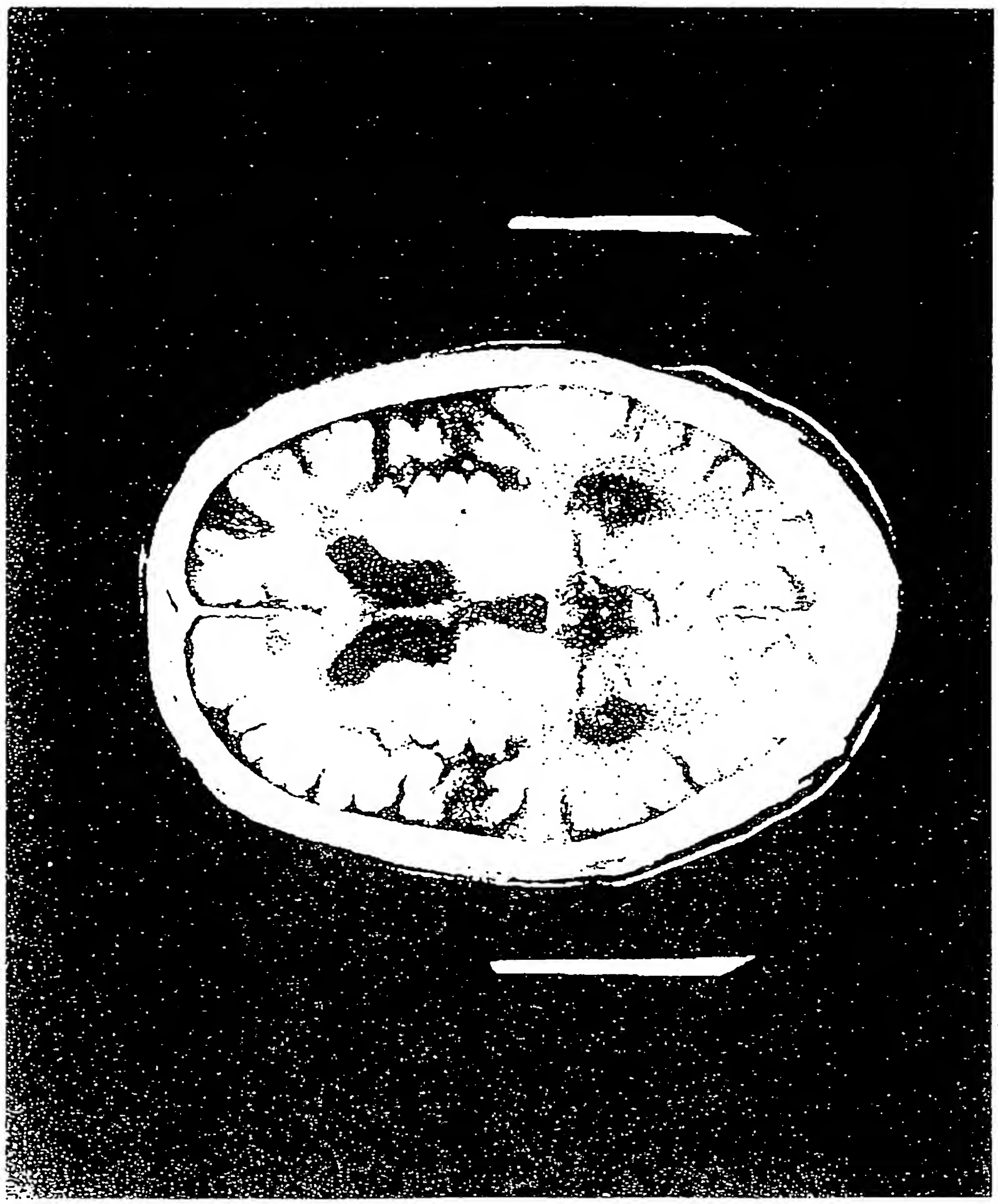


FIG. 7 (a)

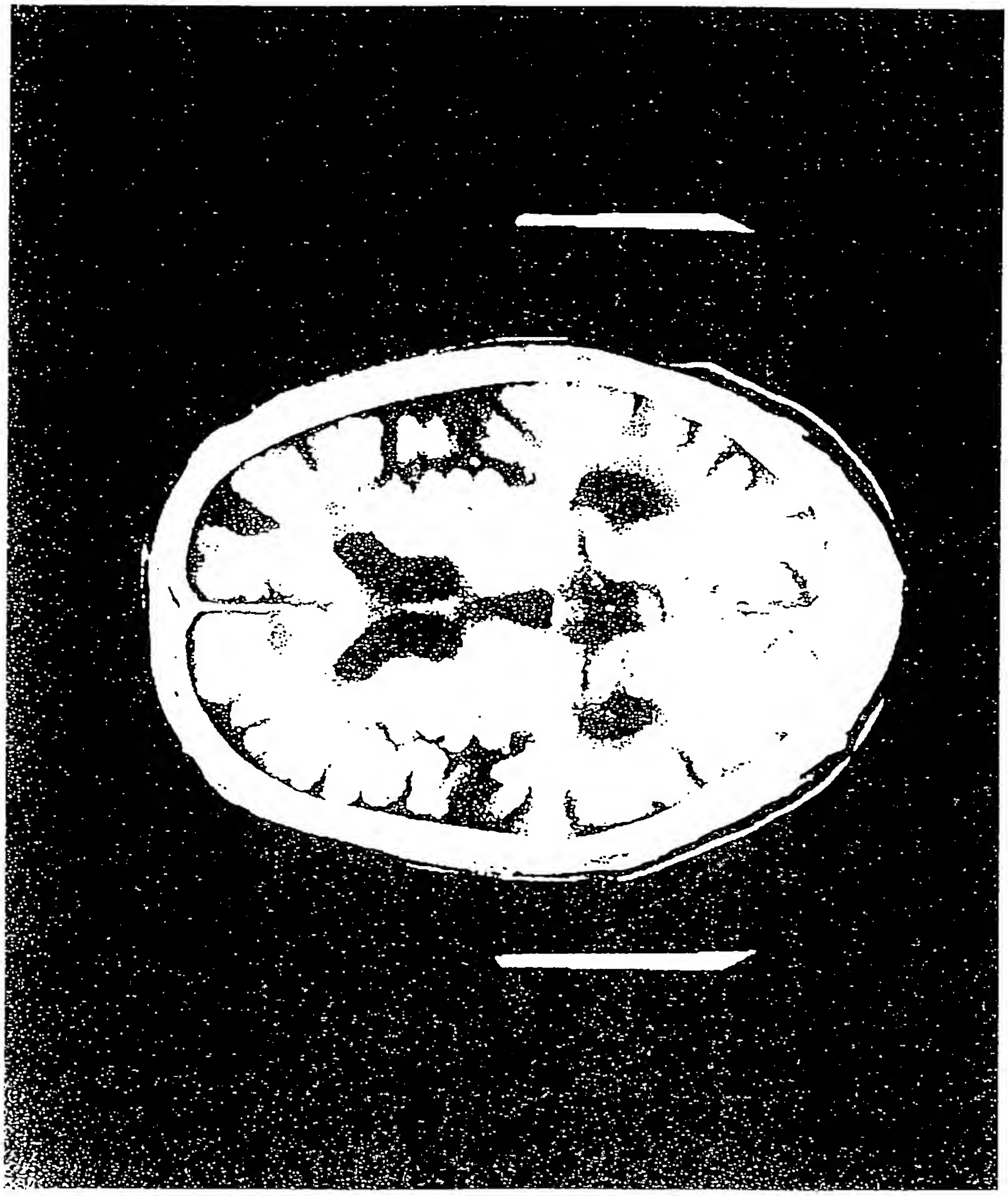
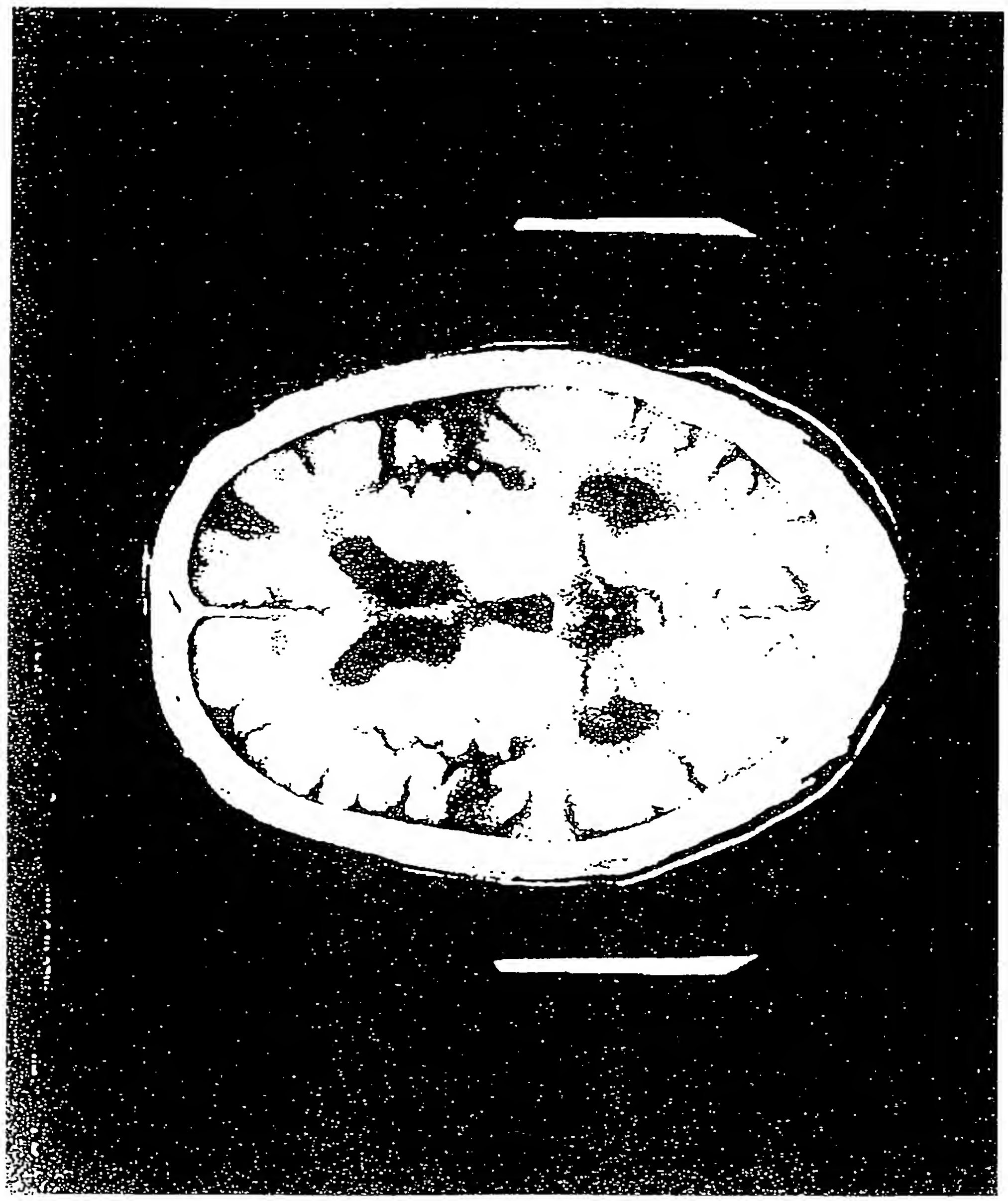


FIG. 7 (b)

FIG. 7 (c)



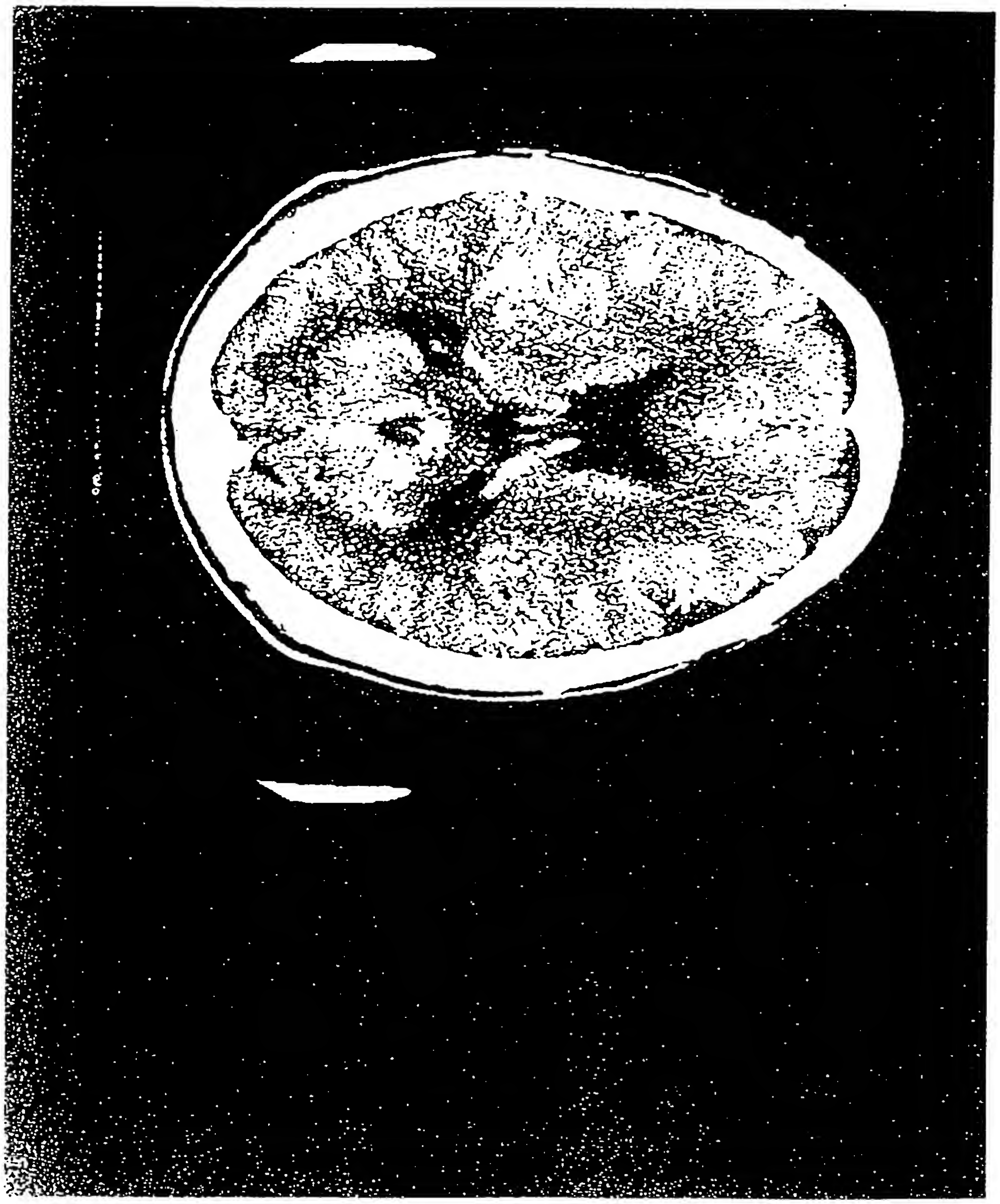


FIG. 8 (a)

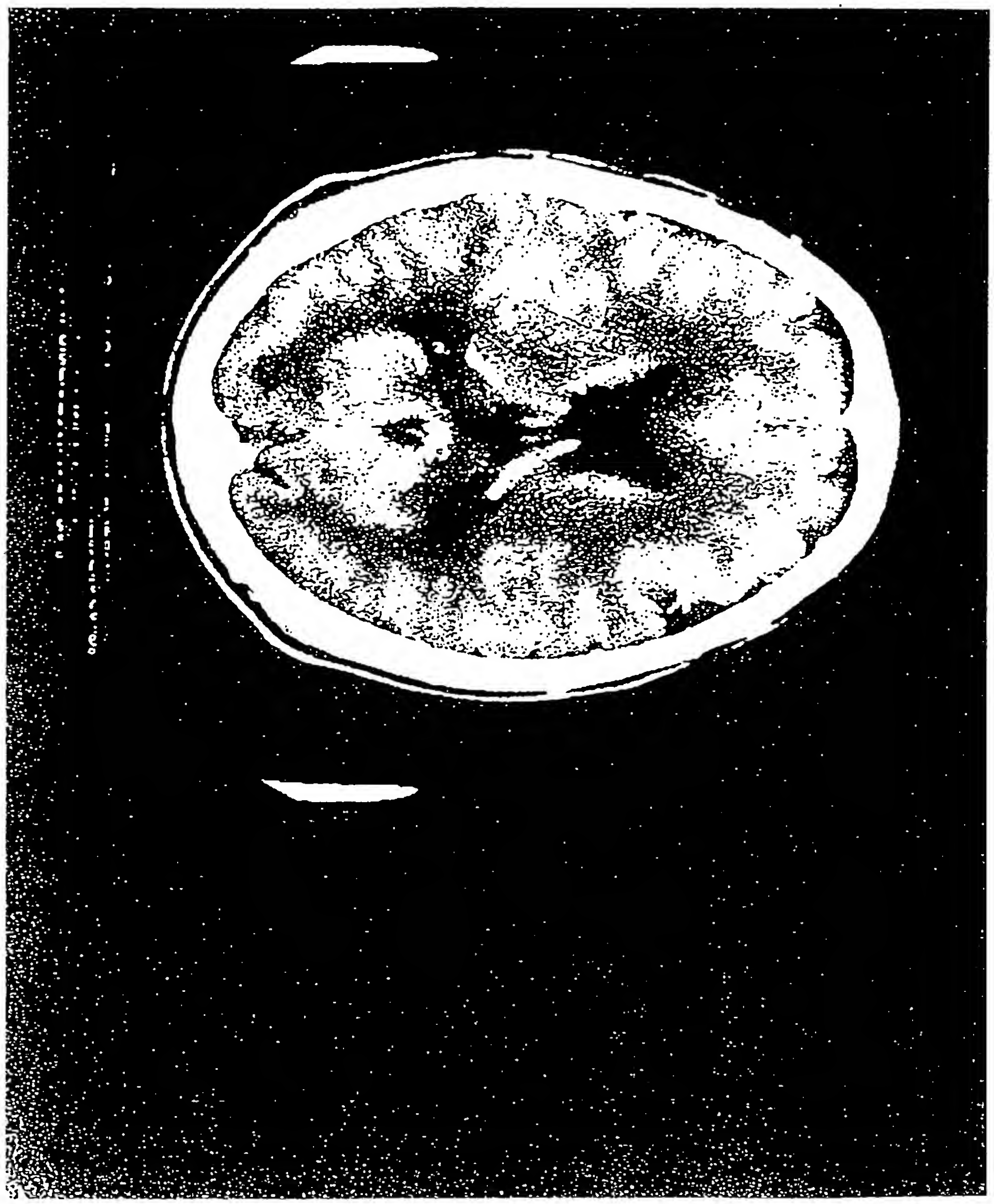


FIG. 8 (b)

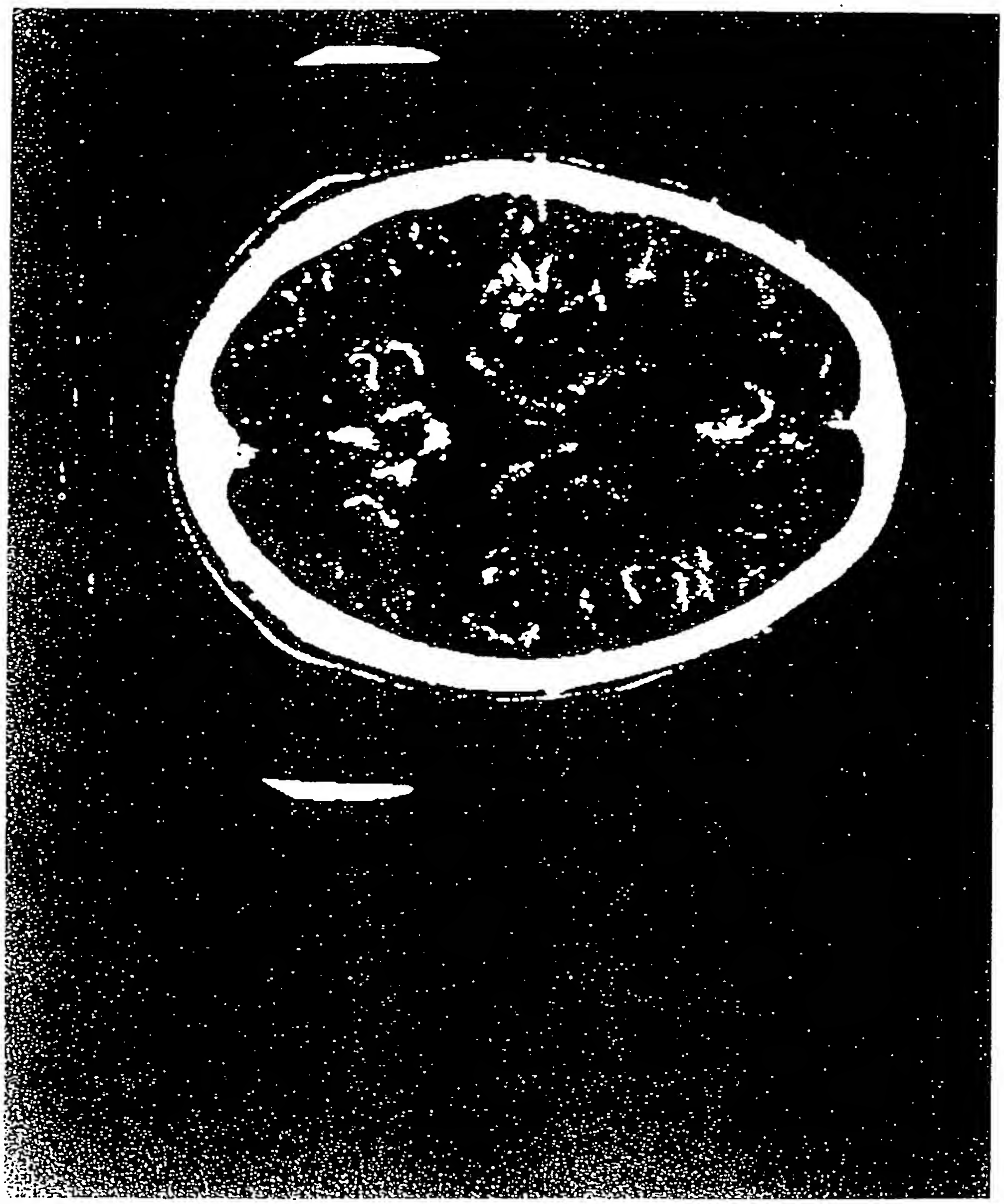


FIG. 8 (c)

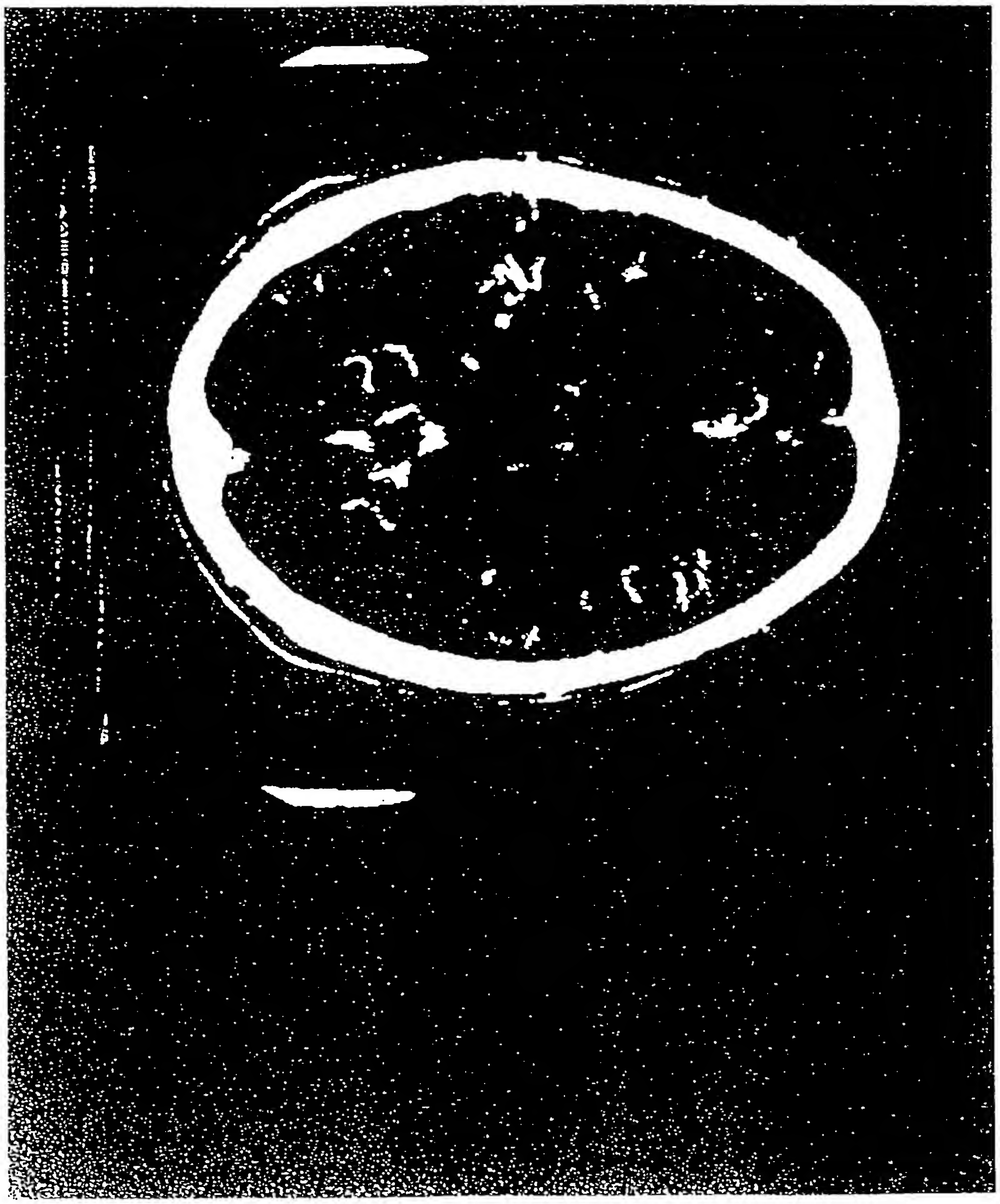


FIG. 8 (d)

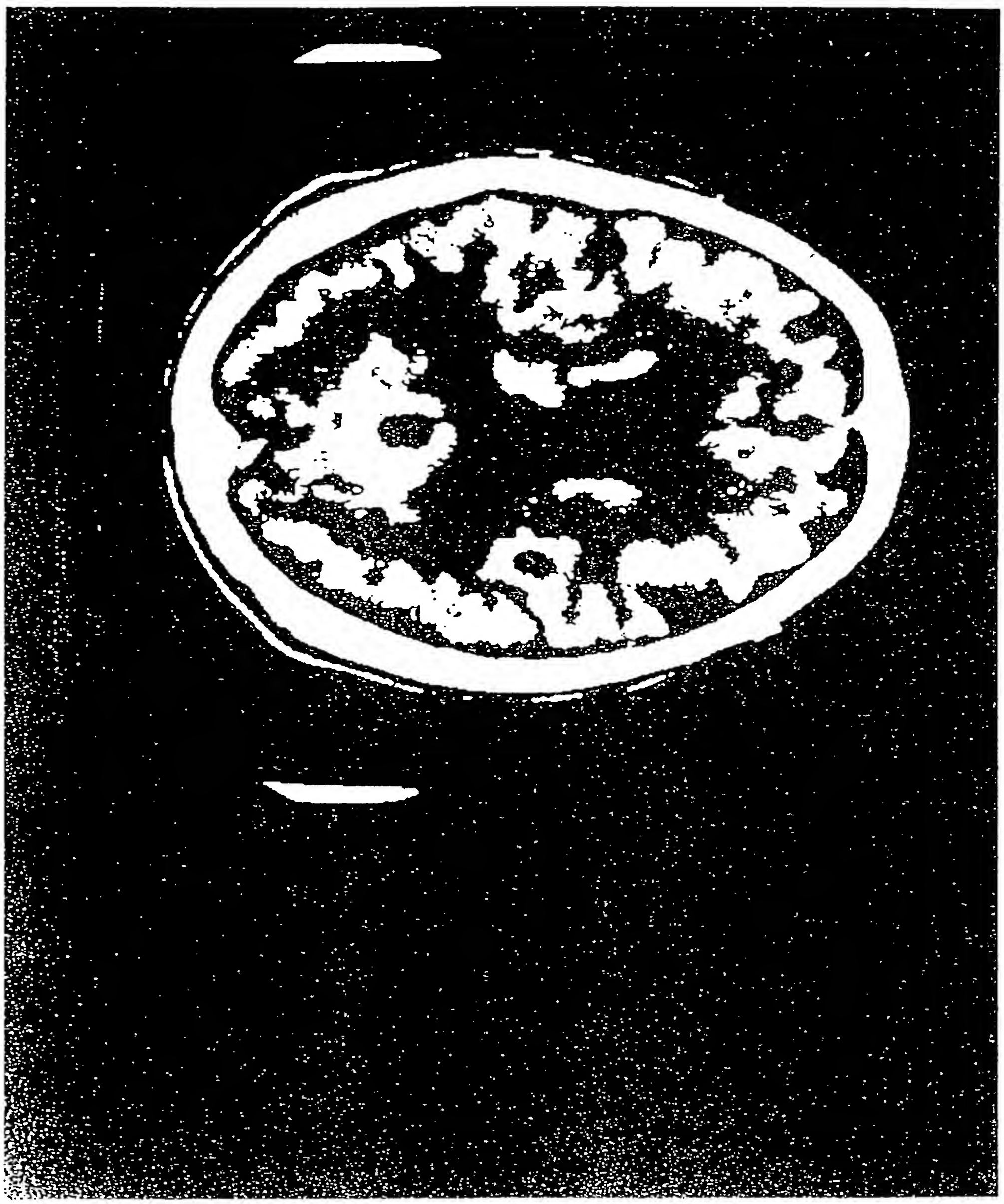


FIG. 8 (e)

FIG. 9

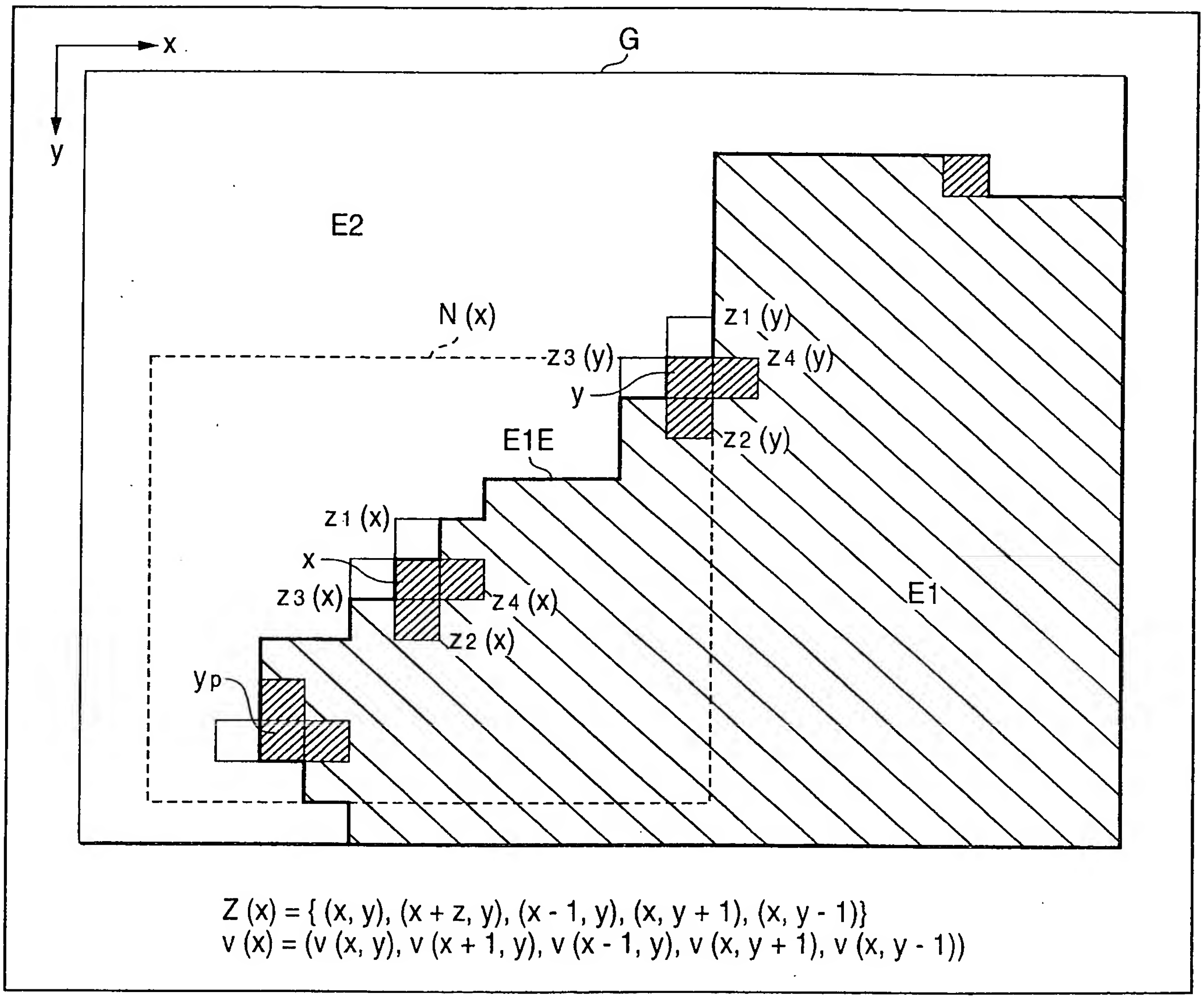

x
y
G
E2
N (x)
z1 (y)
z3 (y)
z4 (y)
y
z2 (y)
E1E
z1 (x)
x
z3 (x)
z4 (x)
z2 (x)
E1
yp
Z (x) = { (x, y), (x + z, y), (x - 1, y), (x, y + 1), (x, y - 1)}
v (x) = (v (x, y), v (x + 1, y), v (x - 1, y), v (x, y + 1), v (x, y - 1))

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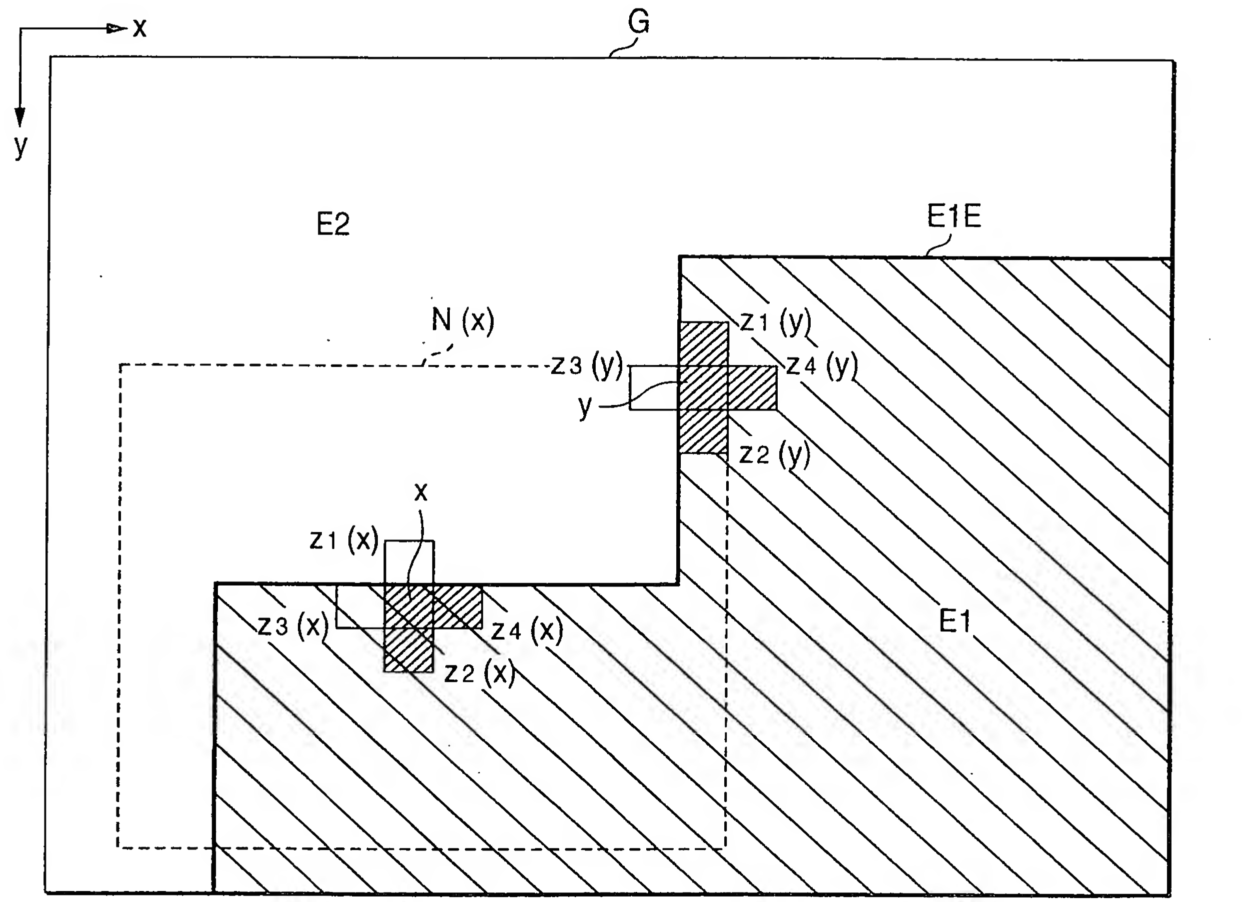
FIG. 10



v (x) = (v (x, y), v (x + 1, y), v (x - 1, y), v (x, y + 1), v (x, y - 1))

FIG. 11

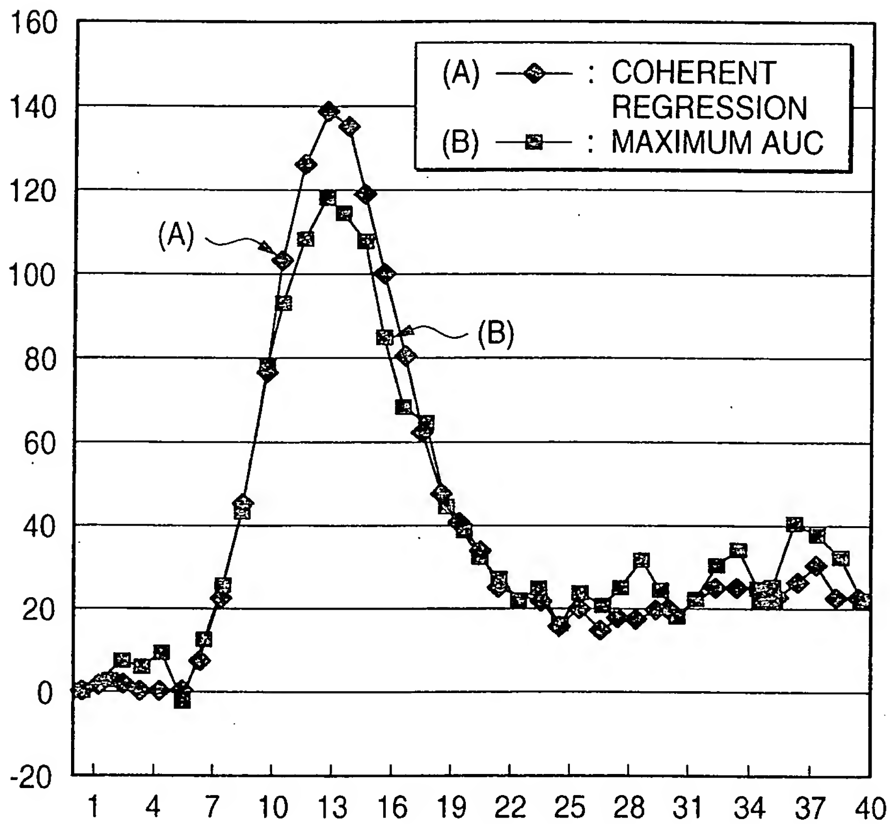

160
140
120
100
80
60
40
20
0
-20
1
4
7
10
13
16
19
22
25
28
31
34
37
40
(A) : COHERENT REGRESSION
(B) : MAXIMUM AUC
(A)
(B)

FIG. 12 (a)

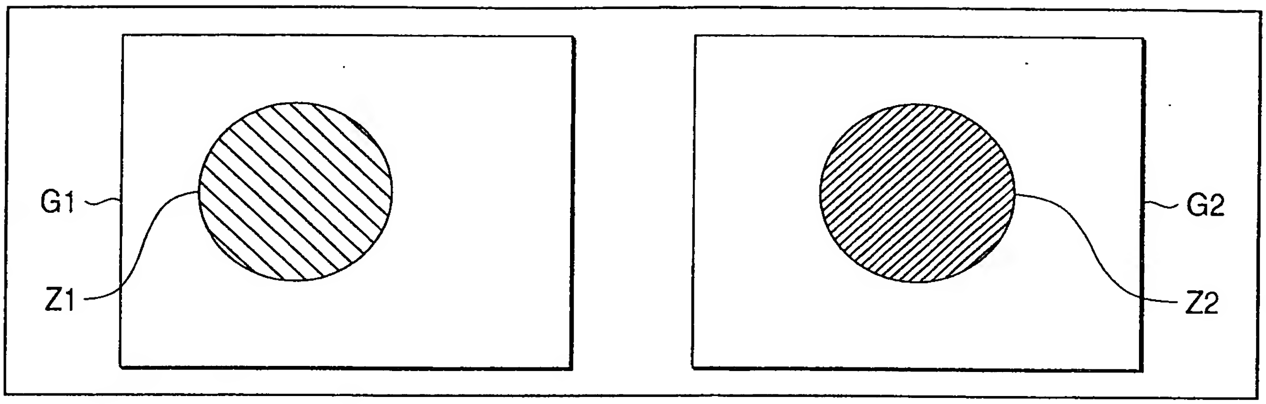


FIG. 12 (b)

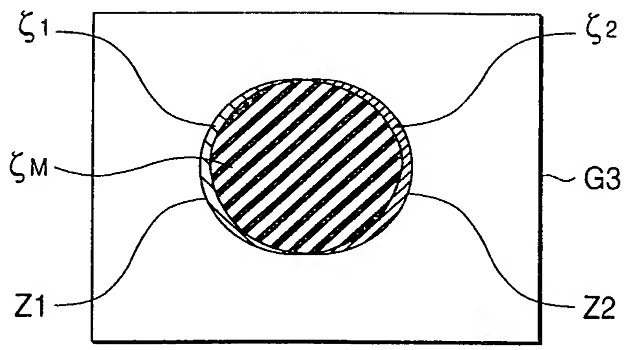


FIG. 12 (c)

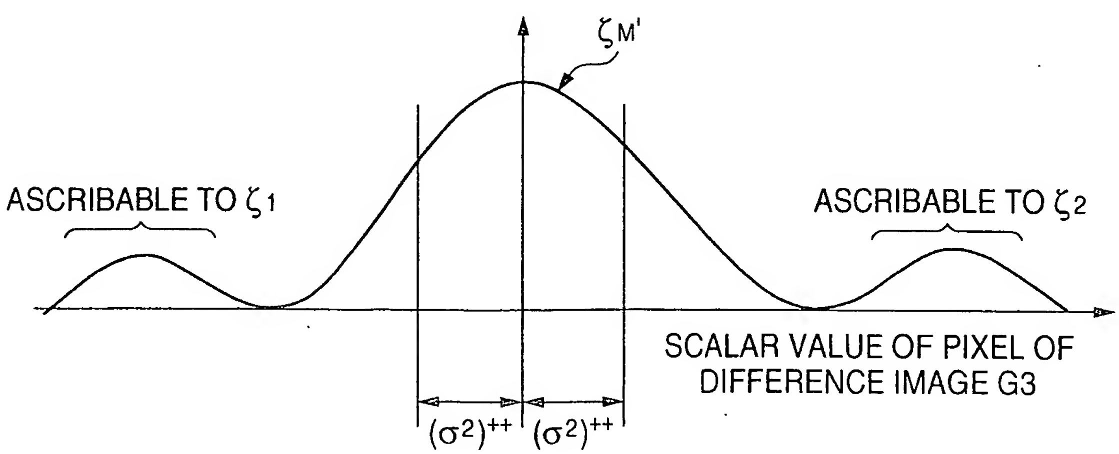


FIG. 13

i
j

(i - 1, j - 1)	(i, j - 1)	(i + 1, j - 1)
(i - 1, j)	(i, j) INPUT VALUE (i, j) OUTPUT VALUE (i, j)	(i + 1, j)
(i - 1, j + 1)	(i, j + 1)	(i + 1, j + 1)

$$g(i, j) = \frac{\sum_{p=-m}^{m} \sum_{q=-m}^{m} w(p, q)\, f(i-p, j-q)}{S}$$

$$S = \sum_{p=-m}^{m} \sum_{q=-m}^{m} w(p, q)$$